mental knowledge of delayed germination. From the physiological side we need to know the structures producing the delay, and how they are acted upon by the various conditions that will shorten it. GASSNER mentions two classes of seeds favored in their germination by light: the "dunkelharten" type, *C. ciliata* and *Ranunculus sceleratus;* and those that are not affected by a period of darkness, *Poa* and many others.—WILLIAM CROCKER.

Osmotic pressure of leaves.—DIXON and ATKINS[11] have devised a thermo-electric method for determining the freezing points of juices of plants. The advantage of the apparatus over BECKMANN'S lies in the fact that the determination can be made with 2.5–5 cc. of liquid instead of 12 cc. or more. The apparatus was used for determining the osmotic pressures of the sap of foliage leaves. The osmotic pressure varied with different species and individuals under the same conditions, but was constant for an individual under a given condition. In an individual of *Syringa vulgaris*, change of condition brought about a change in pressure from 24.58 to 11.58 atmospheres. The amount of pressure was not determined by the height of the leaves above the ground, nor by the resistance of the conducting tracts supplying the leaves, but in every case the osmotic pressure was much greater than the tension of the water supply could have been. Variations were attributed in the main to variations in carbohydrate and water content. The osmotic pressure of leaves increased with insolation, loss of water, and age. The highest osmotic pressure found for *Syringa vulgaris* was 26.87 atmospheres. The authors believe that during summer, when sugars are abundant and transpiration great, leaves of *Syringa* may develop a pressure as high as 30–40 atmospheres. The high pressures of leaves is quite in contrast to the pressures of roots of the same species. The pressures in the roots varies from 4 to 6 atmospheres. These data of course furnish support for the cohesion theory of rise of sap. One wonders how closely the osmotic pressure of extracted juices corresponds to that of the living cells.—WILLIAM CROCKER.

Oxidation of hydrogen by microorganisms.—NIKLEWSKI'S[12] full report of work, which has been intermittently in progress since 1904, makes an interesting and valuable contribution. The study includes the isolation of two species of rod bacteria which are both morphologically and physiologically distinguishable. Neither of the two species isolated can develop in an oxyhydrogen atmosphere without the company of the other, but when both are present under suitable conditions for growth a condensation of the oxyhydrogen gas occurs. If an inorganic nutrient medium is inoculated with

[11] DIXON, H. H., and ATKINS, W. R. G., On osmotic pressures in plants; and on a thermo-electric method of determining freezing points. Sci. Proc. Roy. Soc. Dublin N.S. **12**:275–311. 1910.

[12] NIKLEWSKI, BRONISLAW, Ueber die Wasserstoffoxydation durch Mikroorganismen. Jahrb. Wiss. Bot. **48**:113–142. 1910.

ordinary soil and surrounded by an oxyhydrogen atmosphere containing some carbonic acid, a film will develop which represents the growth of the two species of *Hydrogenomonas*, *vitrea* and *flava*. Through the mutual activity of those two species of bacteria constituting the film, the carbonic acid is reduced and hydrogen is oxidized. Each of those organisms is capable of heterotropic feeding, but *vitrea* is unable to develop upon a series of substances which afford suitable food for *flava*. The reason why neither organism can alone develop in the oxyhydrogen atmosphere is that it cannot endure the high tension of the oxygen, for which limit for injurious effect is close to 53 mm. pressure. Free hydrogen is more or less protected against oxidation by those organisms by organic substances which have a food value for them. The author ventures the opinion that in the presence of carbonic acid the hydrogen is used to form compounds with the carbonic acid which are in turn oxidized.—RAYMOND H. POND.

Reduction.—ZALESKI[13] makes a study of the reduction processes in plants. A brief review of the literature on the subject is followed by a number of experiments. Methylene blue was used as the agent to be reduced. He finds a parallel between the reduction activity and alcoholic fermentation. The main evidence of such a parallel is shown by the fact that various acids, bases, and salts affect similarly the two processes, and plant organs in general show the two processes in a like degree. He points out the fact that we do not know the agent that causes such reductions. It may be an enzyme, reductase or hydrogenase, or it may be a chemical compound capable of absorbing oxygen. One quickly sees the need of a master mind in this field, a person who can use exact chemical methods rather than haphazard ones.

KORSAKOW[14] finds that sodium selenate stops the action of zymase in killed yeast-"zymin"; while it greatly increases its activity in living yeast. This agrees with the effect PALLADIN[15] found that ether and other poisons had on CO_2 (respiratory) production in higher plants. While the selenate stopped the fermentative activity of the dead yeast, it did not modify its reductive power, as shown by the deposit of selenium. Hence it is argued that the two processes are independent, in contrast to ZALESKI's contention.—WILLIAM CROCKER.

Evaporation in marsh vegetation.—Investigating the atmospheric factors in herbaceous marsh vegetation by means of thermometers and a modification of the porous cup atmometer, YAPP[16] demonstrated a marked stratification in

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13 ZALESKI, W., Ueber die Rolle der Reduktionprozesse bei der Atmung der Pflanzen. Ber. Deutsch. Bot. Gesell. **28**:319–329. 1910.

14 KORSAKOW, MARIE, Ueber die Wirkung des Natriumselents auf die Ausscheidung der Kohlensäure lebender und abgetoteter Hefe. Ber. Deutsch. Bot. Gesell. **28**:334–338. 1910.

15 PALLADIN, W., Zur Physiologie der Lipoide. Ber. Deutsch. Bot. Gesell. **28**:120–125. 1910.

16 YAPP, R. H., On stratification in the vegetation of a marsh and its relation to evaporation and temperature. Annals of Botany **23**:275–320. 1909.